Supplemental and Rebuttal Report of Dr. Lisa Handley

This supplemental and rebuttal report addresses the results of the November 2017 election and responds to Dr. John Alford's expert report ("Expert Report of John R. Alford, Ph.D."), Sections I-IV of Dr. Jeffrey Zax's expert report ("Review of the Bayesian Improved Surname Geocoding (BISG) Analysis in the 'Expert Report of Dr. Lisa Handley'"), and Sections I-II of Dr. Zax's supplemental report ("Review of the Bayesian Improved Surname Geocoding (BISG) Analysis in the 'Expert Report of Dr. Lisa Handley': Supplemental Report").[1]

I begin this report by discussing my analysis of the 2017 Eastpointe city council election. This is a particularly probative election because it is the most recent city council election and because both contests included African-American candidates. Despite the importance of these contests, neither Dr. Alford nor Dr. Zax analyzed this election.

My criticisms of Dr. Alford's report rest primarily on his approach to determining if voting is racially polarized, although I also have reservations about some of his estimates of black vote percentages derived from ecological inference (EI) methods. I also disagree with Dr. Zax's approach to ascertaining if a particular election contest is racially polarized. In addition, I disagree with his criticisms of voting analyses that rely on Bayesian Improved Surname Geocoding (BISG).

I. November 2017 Eastpointe City Council Election

The most probative elections when assessing racial polarization in voting are contests for the office at issue (endogenous elections) that include minority candidates. Prior to November 2017, there had only been four Eastpointe city council elections that included

[1] I have not addressed Section V of Dr. Zax's expert report or Sections III-IV of his supplemental report. It is my understanding that Dr. Eitan Hersh will be addressing these portions of Dr. Zax's reports.

African-American candidates.[2] I analyzed these four elections in my initial report, submitted in August 2017. The November 2017 city council election is particularly probative because it is the most recent endogenous election and because both contests – one for a partial-term seat and one for two full-term seats – included African-American candidates.

Two candidates competed for the single, partial-term seat: Michael Klinefelt, who is white, and Tonia Gladney, who is African American. Klinefelt won the seat with 65 percent of the vote. Five candidates competed for the two full-term seats. Only one candidate, Cardi DeMonaco, Jr., is white. As a consequence, at least one of the two winners had to be one of the African-American candidates: Clarence Duren, Edward Williams, Monique Owens or R.J. Johnson. DeMonaco, with 30 percent of the vote, and Owens, with 23 percent of the vote, won the two seats.

A. Statistical Analysis

As in my initial report, I used two sets of data to estimate the demographic composition of the voters in each of the precincts: citizen voting age estimates derived from the U.S. Census American Community Survey (ACS) and turnout data by race based on Bayesian Improved Surname and Geocoding (BISG), which incorporates both census data and surname data concerning the actual voters in each election. I also employed the same two statistical techniques to produce estimates of the percentage of black and white votes or voters supporting each of the candidates: ecological regression (ER) and King's ecological inference (EI).

Table 1, found at the end of the report, provides estimates of the percentage of **votes** blacks and whites gave to each of the candidates using only citizen voting age population (CVAP) data derived from the ACS.[3] ***Table 2***, also at the end of the report, uses BISG data and

[2] The four Eastpointe city council elections that included African-American candidates are the November 2015 election to elect two city council members, a special election in February 2015 to fill a single partial-term position, and the November 2009 and 2011 elections to elect two council members each.

[3] In elections that permit voters to cast more than one vote, only BISG data allows me to easily estimate the percentage of black and white **voters** who cast a vote for each of the candidates because it provides race-specific turnout estimates. When relying on CVAP data alone, I could only estimate the percent of

thus relies on estimates of turnout by race (as opposed to population by race) to produce estimates of voting patterns by race. The voting percentages reported in Table 2 take into account differential rates of turnout by precinct (rather than assuming one turnout rate for all white voters and one turnout rate for all black voters) and are therefore more accurate. In addition, because the analysis rests on turnout by race, these tables provide estimates of the percentage of black and white **voters** who supported each candidate.

B. Findings

In the November 2017 election to fill the partial term, an African American competed against a white candidate, and voters were permitted only one vote. The majority of black voters supported the African-American candidate, Tonia Gladney. When the BISG analysis is considered, Gladney is estimated to have received the support of at least 75 percent of black voters.[4] White voters, on the other hand, very strongly favored Michael Klinefelt. Klinefelt won the election.

Four African Americans and one white candidate competed for the two full-term seats, and voters were permitted to cast up to two votes. Black voters strongly supported two of the African-American candidates, Owens and Johnson, with between 71 and 83 percent of black voters casting votes for these two candidates, based on BISG analysis.[5] White voters strongly favored the white candidate, DeMonaco, who received votes from over 66 percent of the white voters, according to BISG estimates. White voters spread their second votes across the four African-American candidates, with Williams receiving the most white votes and Johnson receiving the fewest. It is likely that some whites cast no second vote rather than vote for an African American: only about 85 percent of the white votes that could have been cast for these

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total ***votes*** cast by black and white voters for each of the candidates, except by using a modified form of ER developed precisely for this purpose. I have provided those estimates as well.

[4] Gladney is estimated to have received between 52 and 60 percent of the votes cast by black voters when CVAP data alone is used to produce the estimates.

[5] Owens is estimated to have received between 30 and 37 percent of the votes cast by black voters and Johnson is estimated to have received between 27 and 31 percent of the votes cast by black voters when CVAP data alone is used to produce the estimates. To be clear, if every voter cast two votes and gave one vote to a candidate, that candidate would still receive only 50 percent of the votes cast.

two seats were cast, according BISG estimates. The white candidate, DeMonaco, received the highest number of votes (30 percent). African-American candidate Owens received the second highest number of votes (23.1 percent) and won the other seat.

Overall, voting in the November 2017 city council election was quite polarized, with white and black voters supporting different candidates in both contests. White voters were successful in electing their preferred candidate, Klinefelt, to the partial-term seat by bloc voting to defeat the black-preferred African-American candidate for this seat. White voters were also successful in electing the only white candidate competing for a full-term seat. Black voters, however, were able to elect one of their preferred candidates, Owens, to the other full-term seat. This was possible, in large measure, because whites did not strongly support any of the African Americans competing for this seat.

C. Conclusion

Substantively significant polarization exists when estimates of black and white voting patterns indicate that the outcome of the election would have been different if it had been held among only white voters or only black voters.[6] I use this test of substantively significant racial polarization (referred to as the "separate electorates test") to determine if an election is racially polarized.

If minority voters express a preference for candidates that is consistently different from that of the majority group, the minority group is cohesive and voting is racially polarized.[7] If the minority-preferred candidates are usually defeated, the level of polarization rises to the level of legal significance, and minority voters have satisfied the second and third requirements of a vote dilution claim, as set out in *Thornburg v. Gingles*.

[6] This discussion is taken from *Minority Representation and the Quest for Voting Equality*, Bernard Grofman, Lisa Handley and Richard Niemi, Cambridge University Press, 1992, page 50.

[7] Voting need not be polarized for the minority group to be cohesive, but if voting is consistently polarized, minority voters are cohesive in indicating a clear preference for candidates other than those supported by the majority of voters.

Voting in recent elections in Eastpointe that included African-American candidates has usually been racially polarized because black and white voters would have elected different candidates. In the November 2017 city council election, black voters would have elected Gladney for the partial-term seat and Owens and Johnson for the two full-term seats. White voters, on the other hand, would have elected Klinefelt for the partial-term seat and DeMonaco and Williams for the two full-term seats.

The results of the 2017 election echo the pattern found in the 2015 general and 2015 special city council elections. In the 2015 general election, black voters would have elected African-American candidate Alexandria Bibb Williams and Sarah Lucido; whites supported the two successful candidates, Lucido and John Marion. In the special election, blacks would have elected African-American candidate Monique Owens, but whites succeeded in electing her opponent, Cardi DeMonaco, Jr.[8]

This pattern of polarization is also reflected in the exogenous elections I analyzed because so few Eastpointe city council elections included African-American candidates.[9] Six of the seven contested elections I analyzed were racially polarized. In the two contests for school board or community college board, the black-preferred candidate did not receive enough votes to be elected if the election had been conducted only in Eastpointe. In the judicial elections – including State Supreme Court elections where political parties nominated candidates – black-preferred candidates received enough votes to be elected if the election had been conducted only in Eastpointe in the three contests conducted in presidential election years and did not in the two contests conducted in non-presidential election years. In the judicial primary election,

[8] The only other city council contests that included African-American candidates (November 2009 and 2011) were not polarized, with black and white voters agreeing on the same (white) candidates in both instances. Notably, Clarence Duren, the only black candidate in the 2011 contest, ran for a full-term seat in 2017 and was the least-preferred candidate among black voters in that contest.

[9] I analyzed all eight recent nonpartisan elections that included African-American candidates. Only seven of these were contested – in the November 2014 school board election only three candidates competed for three positions.

the black-preferred candidate received the third-highest vote total in Eastpointe, advancing to the general election with three other candidates.

Overall, in nearly 77 percent of the recent contested elections in Eastpointe that included African-American candidates (four of the six city council elections – 67 percent – and six of the seven contested exogenous elections – 86 percent), black and white voters have indicated a clear and consistent preference for different sets of candidates. This clear and consistent preference for different sets of candidates indicates that voting is racially polarized, black voters are cohesive in supporting a distinct set of preferred candidates, and whites are cohesive in opposition to these black-preferred candidates. Because the black-preferred candidates are consistently defeated in Eastpointe election – the only black-preferred African-American candidate to win election to the Eastpointe City Council did so in November 2017 because there were no white candidates competing for the second full-term seats – the polarization is legally significant.

II. Response to Dr. Alford

A. Racially Polarized Voting, Cohesion, and *Gingles*

Dr. Alford offers a distinct, and unsupported, approach to determining if voting is racially polarized and if voters satisfy the second and third prong of *Gingles*. After outlining his approach, I will explain my objections to it.

According to Dr. Alford, the first step in determining if an election is polarized is to ascertain if minority voters are politically cohesive; if they fail to meet the arbitrary threshold percentage he has set for cohesion, then the election is not polarized.[10] Dr. Alford defines cohesion in his report (page 9, footnote 1) as follows: "If a minority group gives 50 percent of its vote to one candidate and 50 percent to the other, then they are exhibiting zero cohesion. In practice evidence of voter cohesion in the range of 90 percent and above is usually treated as

[10] Dr. Alford contends that minority political cohesion "must be demonstrated before moving on to the third factor, majority cohesion, and then on to the issue of whether the second and third factor[s] combine durably over time to usually defeat the minority preferred candidate. (page 9, footnote 1).

clear evidence of voter cohesion. The lower bound is less clear, but levels above 70 percent would suggest at least moderate cohesion."

The next step in Dr. Alford's process is to assess whether the minority-preferred candidate wins a seat in the election or is defeated by cohesive, majority bloc voting.[11] Even when he concedes that blacks and whites are cohesive in their support of different candidates, if the minority-preferred candidate wins a seat, Dr. Alford deems the election not to be racially polarized. For example, in the November 2012 election to fill a partial term on Michigan Supreme Court, where over 75 percent of black voters supported the African-American candidate, Dr. Alford finds black voters "show modest cohesion" (page 15). A majority of white voters supported one white candidate, while approximately 35 percent supported the black candidate and another 11 to 13 percent supported a second white candidate. Because the black candidate was the winner, Dr. Alford deemed this race not to have been racially polarized.

Finally, even if Dr. Alford finds that black voters meet his cohesion requirement and that white voters have bloc voted to defeat the black-preferred candidate, if other elections for the same office or contemporaneous contests for different offices are not polarized, Dr. Alford suggests that voting is not really polarized, at least in any significant way.

There are several problems with Dr. Alford's approach:

- First, the assessment of whether minority voters are cohesive is based on an analysis of voting patterns by race over a number of election contests and is not made on a contest by contest basis.
- Second, no bright line distinguishing when voters are cohesive and when they are not has been established in the law or in the social science literature. Even if such a bright line were to be established, 90 percent, or even 70 percent, is a remarkably high bar to set, even in a two-candidate contest.
- Third, Dr. Alford does not adjust his definition of cohesion for factors such as the number of votes that each voter can cast or the number of candidates competing.

[11] It is not clear from Dr. Alford's report whether this requirement necessitates that white voters meet his 70 percent cohesion threshold.

For example, in his discussion of the February 2015 city council election, Dr. Alford does not take into account the presence of three candidates, two of whom were African-American. Dr. Alford did not even attempt to estimate how many black voters supported candidates in contests in which voters could cast more than one vote.

- Fourth, Dr. Alford's suggestion that a contest won by the black-preferred candidate cannot be polarized does not rely on the accepted definition of racial polarization and disregards contests where even he finds black cohesion. If blacks and whites prefer different candidates, the contest is polarized. Only if black-preferred candidates consistently win does this polarization not rise to the level of legal significance.
- Finally, as to Dr. Alford's observations regarding the lack of polarization in elections for the same office held in different years, or for different offices held at the same time, this suggests that any time there are at least a few contests that are not polarized, voting in general cannot be considered racially polarized, at least in any significant way. I am not aware of any substantive basis for disregarding polarized elections in this manner.

B. Participation rates of blacks and whites

Dr. Alford finds that the participation rates of blacks and whites are "similar to, and in some cases higher than white participation" (page 17). He has not estimated these rates himself using either ER or EI. Instead he relies on the estimates I produced using only ACS data, ignoring the fact that I state in my report that BISG estimates provide a more accurate picture of participation and voting patterns by race in Eastpointe. The BISG data shows that blacks consistently turn out to vote at much lower rates than whites.

Table 3, below, provides my estimates of black and white turnout rates using BISG turnout estimates and CVAP data reported by the American Community Survey (ACS) for the pooled five-year period of 2011-2015. These estimates are very similar, but not identical, to

those calculated and reported by Dr. Zax in Table 8 of his report.[12] When the more accurate BISG estimates are considered, blacks consistently turn out to vote at much lower rates than whites. In Eastpointe city council elections, white turnout rates are three to four times higher than black turnout rates.

Table 3: Turnout Rates by Race in Recent Eastpointe Elections

Election	Black turnout (BISG) as percent of black CVAP	White turnout (BISG) as percent of white CVAP
November 2017	7.4	18.8
November 2016	39.1	83.2
August 2016	7.0	19.8
November 2015	4.5	16.7
February 2015	3.7	15.4
November 2014	22.6	50.5
November 2013	4.4	17.2

Although BISG estimates demonstrate that blacks turn out to vote at much lower rates than whites, and despite Dr. Alford having no participation estimates of his own to rely on, Dr. Alford argues Dr. Sugrue wrongly "assumes" that black participation rates are lower than white participation rates (page 7). However, Dr. Sugrue is correct that black participation rates are substantially lower than white participation rates in Eastpointe, especially in odd-year Eastpointe city council elections.

C. Statistical Analysis

Use of BISG data Dr. Alford indicates that he has never relied on BISG data. At least in his recent litigation work for the State of Texas, however, Dr. Alford has conducted election analysis using Spanish surname registration data in place of census demographic data. The

[12] The estimates are not identical for two reasons. First, Dr. Zax uses slightly different ACS CVAP figures than I do. The CVAP totals in Table 6 of his report, from which he derives his Table 8, match neither the five-year 2011-2015 ACS estimates for Eastpointe nor the sum of precinct CVAP totals derived from allocating CVAP to particular precincts, which varies slightly from the total due to rounding the CVAP figures across the precincts. Second, his 2015 general election estimates include an extra 15 "voters" that did not cast votes in the election. It is likely that Dr. Zax counted blank divider rows in my data as additional voters.

State of Texas compiles Spanish surname registration data using the same census surname list probabilities utilized in BISG analysis. There are two differences between the Texas data and the BISG data. First, the probabilities for all racial/ethnic groups identified in the census surname database have been assigned in creating the Eastpointe BISG estimates – not just the probability of being Hispanic. Second, the BISG methodology improves upon this estimation procedure by taking into account both the voter's surname and demographic data related to the voter's geographic location.

Ecological inference My conclusions rest on the results of a statistical analysis that employs ecological regression and ecological inference. Dr. Alford does not object to the use of these statistical approaches – he employs them himself. However, he utilizes a somewhat different methodology and a different statistical package to produce ecological inference estimates in the four contests he separately analyzes.[13] Moreover, he uses these tools only in conjunction with the ACS data – he does not utilize the more precise BISG data.

Because Dr. Alford and I use slightly different statistical approaches, I, like Dr. Alford, do not expect our EI estimates to be exactly the same even when relying on the ACS data to estimate precinct demographics.[14] However, I expect our estimates using only ACS data to be similar. In fact, our ER estimates for black and white votes are very close. Our EI estimates for white votes are also very similar across all four contests using ACS data only. Our EI estimates for black votes using ACS data are very similar across two of the four contests: the 2009 and 2011 elections. They differ markedly for the 2015 general election, however. My EI estimates

[13] I rely for the most part on statistical packages called "ei for R" and "eiCompare." Although Dr. Alford states that he relies on "Gary King's Ecological Inference," (page 4), as I have, it appears that he has relied on a variation of King's methodology, found in the statistical package "eiPack" called ei.MD.bayes.

[14] It is because we use different statistical approaches and different statistical packages to produce ei estimates that Dr. Alford is able to report black percentage estimates for the February 2015 special election for city council and I am not. In the February 2015 city council election, relying only on ACS data for demographic information, King's ei does not arrive on plausible estimates for black voter preferences – the total preferences are nowhere near 100 percent and standard errors were very high. Similarly, King's ei does not arrive on plausible estimates for black or white voter preferences in the 2011 mayoral election or for black or white turnout in the 2007 mayoral election.

for black votes for the three candidates are very close to the ER estimates we both arrived at – Dr. Alford's EI estimates for black votes for these three candidates are the outliers. In addition, while I was unable to produce accurate estimates for the 2015 special election using King's EI, Dr. Alford reports very different EI estimates for black votes than either of our ER estimates. Dr. Alford's estimates are also very different than those I produce using EI with the BISG data. Dr. Alford does not explain in his report why his EI estimates of black votes for the three candidates in each of these two contests varies so markedly from his own ER estimates, let alone from my ER and EI estimates.[15]

D. Assessment of Elections

Dr. Alford does not analyze the most recent Eastpointe city council election, despite the fact that it included two contests with African-American candidates. Dr. Alford argues that none of the four city council contests that he did analyze were racially polarized. While we concur that neither the 2009 nor 2011 city council contests were polarized, we disagree on the other two contests he analyzed, the 2015 general and special elections.

2015 general election In the November 2015 general election for city council, voters could cast two votes to elect two candidates. Three candidates competed, one of whom was African American. According to my estimates, if black voters alone had chosen the two winners, the African-American candidate, Alexandria Bibb Williams, would have obtained one of the seats. (The ER and EI estimates derived using the more accurate BISG data indicate that Williams was the first choice of black voters; the estimates derived using only ACS data indicate she was the second choice of black voters.) The other candidate supported by black voters was Sarah Lucido. White voters in this contest supported Lucido and John Marion, who were elected.

[15] Dr. Alford's EI estimates regarding black voters in the 2015 city council contests are also concerning given the simple correlation between levels of support for black candidates and black population in particular precincts. For example, there is a substantial positive relationship between the presence of black eligible voters in a precinct and support for Bibb Williams in the November 2015 election. Nonetheless, Dr. Alford's EI estimates indicate that black support for Bibb Williams is actually less than white support.

Again, Dr. Alford's EI estimates of black support for each candidate in this contest differ from mine, even when relying only on ACS data and not on BISG, although his ER estimates are quite similar. However, he argues that even looking to his ER estimates, which indicate that Williams was the second choice of black voters, the contest is not racially polarized because blacks were not cohesive – "Black support for Williams doesn't reach a level that could be considered cohesive under any circumstance" (page 9). The ACS-only ER estimates for Williams are 30.8 percent (Alford) and 32.2 percent (Handley). Over 60 percent of black voters would have had to cast a vote for Williams in order for her to receive over 30 percent of the black votes in a two-vote contest, and so Dr. Alford's conclusion rests only on his unsupported 70 percent bright-line rule. The BISG estimates, because they are based on turnout, actually provide us with estimates of the percentage of black voters who cast a vote for Williams, and it is at least 79 percent, above even Dr. Alford's bright-line threshold.

2015 special election: In the special election held in February 2015 to fill a partial term, two African Americans competed along with a white candidate, and voters were permitted only one vote. As described above, I was unable to produce accurate estimates of black voting behavior using King's EI for this contest when using only ACS data and not BISG. However, I was able to produce ER estimates. More importantly, I was able to produce more accurate estimates with ER and EI using the BISG data. Both the ER estimates using ACS data and the ER and EI estimates using BISG data indicate that African-American candidate Monique Owens was the black-preferred candidate. Whites overwhelmingly supported the one white candidate running, Cardi DeMonaco, Jr. Based on these results, I concluded the contest is polarized.

Dr. Alford produces both ER and EI estimates using only ACS data. Dr. Alford's ER estimates are very similar to mine and indicate that Owens is the candidate of choice of black voters. Dr. Alford argues that even if the ER estimates are taken to be an accurate depiction of black and white voting in this election, voting is not polarized because only 52.8 percent of black voters supported this candidate in a three candidate race. Again relying on his bright-line rule, he contends that 52.8 percent is "hardly cohesive" (page 9) in this three-candidate contest.

Dr. Alford supports his contention that black voters would not have elected Williams in November 2015 or Owens in the special election held in February 2015 by reviewing the voting behavior of the three precincts that are majority black in CVAP: precinct 7, which is 58.2 percent black in CVAP; precinct 8, which is 61.4 percent black in CVAP; and precinct 12, which is 52.5 percent black in CVAP. However, as Table 3 in my initial report indicates, the actual compositions of voters in these three precincts during these at-large city council elections are not even close to majority black, let alone overwhelming black as required in homogenous precinct analysis. The BISG estimates indicate that 28.2 percent of the voters in precinct 7 were black, 29.0 percent of the voters were black in precinct 8, and 22.3 percent of the voters were black in precinct 12 in the 2015 general election. Analysis of voter preferences drawn from individual precincts is supportable only when those precincts are racially homogenous; therefore, drawing conclusions about black voting behavior from these three precincts alone is misleading.

Exogenous elections: Although Dr. Alford did not analyze any elections other than four of the six city council elections that included African-American candidates, he offers conclusions about polarization in the exogenous elections I analyzed. Because he requires minorities to provide overwhelming support for their preferred candidate and the black-preferred candidate to lose the election before making his single assessment of whether an election is polarized, Dr. Alford found virtually none of these elections to be racially polarized. The only two elections that included African-American candidates that Dr. Alford indicated showed "any evidence of a candidate cohesively supported by Black voters being defeated by cohesive white votes in opposition" (pages 16-17), he appears to disregard because other elections for the same office or contemporaneous contests for different offices are not polarized. Specifically, Dr. Alford suggests that the 2010 Michigan Supreme Court contest was a "partisan result" rather than a racial result and should also be disregarded because the other two Michigan Supreme Court contests (2012 and 2014) were not polarized. Similarly, he asserts that although the 2009 school board contest was polarized, it should be disregarded because he has concluded that the other school board elections – none of which were contested, interracial contests – and the 2009 Eastpointe city council election were not polarized.

The table appended to this rebuttal report summarizes the conclusions I reached in all 13 of the contests I analyzed that included minority candidates. It compares my conclusions to those reached by Dr. Alford in the 11 contests on which he offers comments. (I have also included Dr. Zax's conclusions regarding the eight contests analyzed by me using both the ACS-only data and the BISG data.)

III. Response to Dr. Zax

A. Defining Racial Polarization and Determining if Elections Are Polarized

In Tables 1 and 2 of Dr. Zax's report, he offers his own opinions of whether the eight contests I analyzed using ACS data only and using BISG were polarized. He conducts no analysis of his own; he simply redefines racial polarization and applies his definition to my results. Dr. Zax, like Dr. Alford, believes that if the black-preferred candidate won, the contest was not polarized. As noted above, I believe that if blacks and whites prefer different candidates, then the contest is polarized. However, if the black-preferred candidates consistently win over time in the most probative elections, the polarization does not rise to the level of legal significance.

In his process of evaluating whether voting in Eastpointe is racially polarized, Dr. Zax fails to distinguish:

1. Elections that are more probative from those that are less probative. His assessment does not separate those contests that included African-American candidates from those that did not. Neither the 2015 mayoral contest nor the 2013 election for city council included African-American candidates and therefore have less probative value.
2. Elections that were contested from those that were not. The November 2014 school board election had only three candidates for three seats, hence all three candidates were preferred by black and white voters by default.
3. Elections in which black and white voters could cast more than one vote and therefore had more than one preferred candidate.

When Dr. Zax's tables 1 and 2 are re-examined with these three points in mind, there are only five contests with clear probative value to tally – the five contested elections that included African-American candidates.[16] Dr. Zax and I agree that the 2015 special election for city council was polarized,[17] as was the November 2014 election for the partial term on the Michigan Supreme Court. Dr. Zax and I also agree that the November 2016 election for Judge of the 16th Circuit Court was not polarized.

We agree in part and disagree in part concerning the November 2015 city council election. When the BISG estimates are considered, which indicate Williams was the first choice of black voters, we agree the contest was polarized. However, according to the ACS-only estimates, Williams is the second choice of black voters. Dr. Zax argues that the contest was not polarized in this instance because the first choice of both black and white voters won a seat. He ignores the fact that voters in the election cast two votes and therefore had two candidates of choice, and that there were two winners. The only black-preferred candidate to win a seat in this election was the white candidate, Lucido. Moreover, it is meaningful if the only black-preferred candidates who can win municipal elections in Eastpointe are either white candidates or black candidates not opposed by white candidates.

[16] Dr. Zax and I agree that the two elections he reviews that do not include African-American candidates – the 2015 mayoral race and the 2013 city council election – are not racially polarized. We characterize the 2014 school board election with three candidates for three seats differently: he contends the contest is not polarized because the black-preferred candidate won. Although I agree that blacks and whites would have elected the same candidates, this is by default only, and I do not believe it can be asserted that the contest was not polarized as a consequence. Moreover, the first choice of black voters was the last choice of white voters and a number of white voters cast fewer than their three allotted votes to avoid voting for the black-preferred minority candidate.

[17] Dr. Zax agrees that the contest is polarized when the BISG estimates are considered but indicates the outcome is "undetermined" when reviewing the ACS estimates (page 4, table 1), ignoring the results of the ER analysis. Dr. Zax dismisses this technique in a footnote citing only his own article (page 1, footnote 2), despite the broad acceptance of ER in Voting Rights Act litigation – and its use by Dr. Alford in this case. Dr. Zax's arguments have also been addressed and rejected in the academic literature. Bernard Grofman and Matt A. Barretto, "A Reply to Zax's (2002) Critique of Grofman and Migalski (1988)," *Sociological Methods and Research*, 37(4), May 2009.

With regard to the fifth contest, the primary election in 2016 for the Judge of the 16th Circuit Court, Dr. Zax determines the contest is not polarized because the black-preferred candidate won. I conclude that the election is polarized because black voters supported African-American candidate Teri Lynn Dennings (their first choice) and white candidate Racheal Rancilio and whites supported Michael Servitto and Rancilio.

As noted above, the appendix of this report summarizes and compares the conclusions reached by Dr. Zax (as well as Dr. Alford) in the contests that included minority candidates that I analyzed using both the ACS-only data and the BISG data.

B. BISG Methodology and Data

Analyses employing the BISG estimates offer the most accurate picture of black and white voting patterns in Eastpointe. This is because the BISG estimates provide the best indication of the black percentage of the electorate in each precinct at the time of the election. Dr. Zax disagrees and identifies what he claims are three errors in my implementation of the BISG methodology. However, he is incorrect in all three instances:

- In his initial expert report, Dr. Zax indicated that I did not have the appropriate data for the 2015 special election to the Eastpointe City Council – he believed I was missing the absentee ballots. I did include the absentee ballots and therefore did have the appropriate data for the analysis.[18] In his supplemental report, Dr. Zax acknowledges receipt of these data.
- Dr. Zax contends that the BISG estimates of the percent of voters in the 2015 and 2016 general elections who are black, as set out in Table 3 in my initial report, are incorrect. However, the turnout figures in Table 5 of Dr. Zax's report are erroneous, for the reasons I explain below.

[18] It is my understanding that the City of Eastpointe requested that the United States provide processed voter data, although the voter data originated with the City. The United States agreed to provide the data but inadvertently did not include absentee voters in the file concerning the 2015 special election. Once the United States identified this error, it notified Defendants and corrected the data production.

- Dr. Zax believes my BISG estimates are "contaminate[d]" (page 13) by errors he identifies – correctly – in the illustrative table of ten voters in the appendix of my initial report. Although the illustrative table contains mistakes – which I will explain below – the estimates in the database are correct, including for the ten voters displayed in the illustrative table.

I will discuss the second and third points below. I will then address several secondary critiques set out by Dr. Zax.

BISG estimates of black voter turnout for the 2015 and 2016 elections Because the votes cast for each candidate in an election are available only as compiled at the precinct level, precinct level data (rather than individual level data) must be relied upon to produce estimates of the percentages of minority and white voters supporting particular candidates. Ecological inference is a means of relating the racial composition of the election precincts to the votes cast by black and white voters within these precincts.[19] Often the racial composition of the voters in each precinct is not available because the jurisdiction does not keep records of voters by race (most jurisdictions do not). The next best option, albeit one step removed from turnout data by race, is registration data by race. Again, only a few states collect this information. As a result, investigators must often substitute the population of eligible voters by race – either voting age population or citizen voting age population – as a proxy for the voters who actually cast a ballot when conducting an analysis of voting patterns by race.

The substitution of turnout data by race with voting age population (or citizen voting age population) by race has implications for the analysis, especially if minorities and whites turnout to vote at different rates, particularly across different precincts. For example, if blacks turnout to vote at lower rates than whites, a precinct that is 40 percent black in voting age

[19] For example, when using ecological regression to estimate the percentage of black voters supporting a given candidate, each observation (precinct) is placed on the scatterplot based on the percentage of the voters in the precinct that are black (or white) and the percentage of votes cast for any given candidate. In King's EI, each precinct is represented by a line (rather than a point) which is drawn based upon the method of bounds, which calculates the set of possible percentage of votes black (or white) voters could have provided to a particular candidate based on, again, the demographic composition of the voters in the precinct.

population might only be 20 percent black in voters. Although it is the black share of the voters that we are actually interested in for conducting the analysis, the substitution means that the less accurate 40 percent is used in the analysis rather than more accurate 20 percent.

Table 3 in my initial report illustrates the impact of substituting the percentage black turnout with the percentage black voting age population (or citizen voting age population) by precinct. It lists four sets of estimates of the percentage black of the electorate in recent election in Eastpointe based on 2010 census VAP (black VAP over total VAP), ACS estimates of CVAP for the pooled five-year period of 2011-15 (black CVAP over total CVAP), and BISG estimates created using the voter turnout list for the November 2015 and 2016 elections (black turnout over total turnout). In precinct 1, for example, these values are 30.2 percent black VAP, 34.6 percent black CVAP, and 12.3 percent 2015 black turnout. The estimates of the percentage of black voters who supported each candidate jurisdiction-wide will be different depending on whether 30.2, 34.6, or 12.3 percent is used to denote the demographic composition of the voters of this precinct as well as all of the other precincts.

In Table 5 of Dr. Zax's report, he identifies what he contends are the "correct BISG turnout estimates" for the 2016 and 2015 general elections (page 14). It appears that Dr. Zax has calculated black turnout rates (black turnout over black CVAP) rather than black share of precinct turnout (black voters over total voters). Only the latter figure, provided in my initial report in Table 3, can be used as the demographic component of an ecological analysis of voter preferences.

It is curious that Zax places black turnout rates next to my estimates of the black share of actual voters because my initial report clearly stated that the purpose of Table 3 is to illustrate the impact of substituting percent black voting age population (2010) or citizen voting age population (ACS11-15) for the optimal aggregate level data for the ecological inference analyses performed – the percent black of the actual voters. Therefore, Dr. Zax's assessment of BISG turnout estimates does not undermine my application of BISG or the analysis that I conducted based on BISG estimates of the actual voters in each precinct in each election.

BISG data and the illustrative table in Handley Appendix Dr. Zax suggests the BISG estimates I relied on were inaccurate because of inaccuracies that he identifies in an illustrative table in the Appendix of my initial report. The BISG estimates in the database that I used to conduct my analysis are correct. However, Dr. Zax is correct in noting transcribing errors in my illustrative table. ***Table 4***, below, includes the actual BISG estimates for the ten voters included in the illustrative table.

Table 4: Actual BISG estimates for voters included in illustrative table in Handley Appendix

	Probability (percent) based on surname				Racial/ethnic composition of census block group				Probability based on geographic location				BISG probability estimates			
Surname	pctwht	pctblk	pcthis	pctoth	hcvap	bcvap	wcvap	othvap	pwvap	pbvap	phvap	povap	white	black	hispani	other
Daniel	67.02	24.05	4.269	4.661	40	70	440	0	0.0320	0.0081	0.0638	0.0000	0.8213	0.0744	0.1043	0.0000
Koresky	70.5	11.3	11.1	7.1	40	70	440	0	0.0320	0.0081	0.0638	0.0000	0.7384	0.0299	0.2317	0.0000
Hines	60.48	35.61	1.49	2.42	40	70	440	0	0.0320	0.0081	0.0638	0.0000	0.8349	0.1241	0.0410	0.0000
Colville	94.41	0.79	1.73	3.07	40	70	440	0	0.0320	0.0081	0.0638	0.0000	0.9628	0.0020	0.0352	0.0000
Colville	94.41	0.79	1.73	3.07	40	70	440	0	0.0320	0.0081	0.0638	0.0000	0.9628	0.0020	0.0352	0.0000
Schrodt	99.32	0	0	0.68	0	180	245	0	0.0178	0.0208	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000
Gottler	99.31	0	0	0.69	20	135	565	40	0.0411	0.0156	0.0319	0.0639	0.9893	0.0000	0.0000	0.0107
Grandberry-	2.72	93.31	1.2	2.77	0	180	740	5	0.0538	0.0208	0.0000	0.0080	0.0695	0.9200	0.0000	0.0105
Washington	5.16	89.87	1.45	3.52	0	180	245	0	0.0178	0.0208	0.0000	0.0000	0.0469	0.9531	0.0000	0.0000
Hernandez	4.55	0.38	93.81	1.26	25	310	905	5	0.0658	0.0358	0.0399	0.0080	0.0737	0.0033	0.9205	0.0025

In creating the table for illustrative purposes, I changed some of the names from the sample I drew because they were quite unique and could easily be associated with just one voter and might raise privacy concerns. However, I failed to correct all of the entries for the column "Hispanic probability based on geographic location," which in turn meant that I produced slightly different BISG estimates than those found in the actual data when I recalculated the estimates for the table. The table above serves as a correction to the illustrative table in the appendix of my report and reflects the actual BISG estimates for these ten voters.

Dr. Zax had the actual BISG database used to conduct my analysis. He does not state that the same errors are found in the actual BISG database or identify other, similar errors. In fact, there are none.

Voters of Hispanic and "other" racial/ethnic identity Dr. Zax next raises the concern that I have omitted individuals who are neither black nor white from my analysis. It is true that I do not provide estimates of voting behavior for these voters. Because the voters I have labeled as "other" – Asian and Pacific Islanders, American Indians and Alaska Natives, and multiracial individuals – comprise such a small component of the population in Eastpointe, as well as a small component of voter turnout, it is impossible to produce valid estimates of the vote choices of these groups – either individually or in combination (though there is no reason to believe they vote alike and therefore should validly be combined). Hispanics also make-up only a very small portion of the population (and voter turnout) and therefore no accurate estimates can be produced for this group either. Therefore, like defendant's expert Dr. Alford, I report estimates only for black and white voters.

The estimates for black and white voters using BISG data are not produced in statistical procedures that "ignore[]" Hispanics or the other racial groups, however, as Dr. Zax presumes (page 15). When estimates of the percentage of black voters is calculated, this is with reference to all non-black voters; when estimates of the percentage of white voters is calculated, this is with reference to all non-white voters. Differences between my ACS-only analysis and BISG-based analysis result only from the more accurate estimate of participating voters, rather than the marginally larger share of Hispanic and "other" voters in the BISG analysis.

Differential turnout and the viability of an illustrative black district The illustrative four-district plan I drew demonstrates that the black population in Eastpointe is sufficiently large and geographically compact to comprise a majority in a single-member district. Dr. Zax does not dispute this fact.

Instead Dr. Zax argues that the majority-black district in my plan would not be a "viable" black majority district because black voters turn out at lower rates than white voters. However,

the illustrative plan I offered was not accompanied by an analysis of the relative strength of minority voters because it is not being offered as a remedy at this stage of litigation. Nor is black voter turnout in an at-large system where they have been consistently out-voted by a white majority necessarily indicative of how black voters would behave in a single-member district where they have an opportunity to elect their preferred candidate.

Dr. Zax's flawed methodology for gauging the consistency of turnout estimates The reason for using BISG estimates is that any estimates of voting patterns by race, including turnout by race, that rely on citizen voting age population alone and either EI or ER are likely to be less accurate than estimates that incorporate information concerning voter turnout. This is because citizen voting age population percentages are imperfect substitutes for the percentages of black and white voters in the Eastpointe electorate in a given election. This, however, is not the grounds for Dr. Zax's contention the turnout estimates are "internally inconsistent" (pages 21-26). His argument rests on sets of algebraic equations he uses to calculate what he refers to as the "implied turnout" of blacks and whites, which he derives from the preferences of black and white voters (as indicated by the EI estimates derived using BISG data) and the total number of votes received by the candidates (as designated by the actual election results). However, a two-equation algebraic approach incorporating "two equations in[cluding] the two unknown turnout rates" (page 21, footnote 5) would produce accurate turnout figures by race only if black and white voters supplied all of the votes that each candidate received. But as Dr. Zax points out elsewhere in his report, blacks and whites were not the only voters casting votes. Hispanics and "others" also cast votes in the contests examined, and the candidate totals reflect this.

Take Dr. Zax's first example, the 2015 general election. For the solution to the algebraic model proposed by Dr. Zax to produce a valid estimate of the number of black and white voters in his first two-candidate comparison (Williams and Marion), all 939 votes received by Williams and all 1459 votes received by Marion had to have come only from black and white voters. But according to Dr. Zax's Table 6, the election included not only 2312 white voters and 390 black voters, but 100 Hispanic and 99 "other" voters as well. These 199 voters had to have cast votes for at least some of the candidates competing.

Because the algebraically derived "implied turnout estimates" Dr. Zax reports rest on the incorrect assumption that candidate totals reflect the votes of only black and white voters, his approach to ascertaining the "internal consistency" of the BISG turnout estimates is fundamentally flawed and tells us nothing about the consistency of the BISG estimates.

IV. Conclusion

Nothing in the reports of Dr. Alford and Dr. Zax have led me to alter my conclusion regarding black voters in Eastpointe city council elections. Blacks are sufficiently large and geographically concentrated to constitute a majority of the voting age population in a district if a four-district plan was adopted to elect council members. Voting in recent Eastpointe elections that included African-American candidates was consistently racially polarized, when racial polarization is correctly defined. Black and white voters are consistently supporting different candidates, with black voters cohesive in support of their candidates of choice, and whites usually bloc voting against these candidates. The level of racial polarization found in Eastpointe rises to the level of legally significant because black-preferred candidates are usually defeated.

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed this 16th day of February 2018

Lisa Handley

Table 1: 2017 City Council Contests Analyzed using Citizen Voting Age Population Only

2017 City Council Elections	Race of Candidate	Actual Percent of Votes Received by Candidate	Percent of Black Votes			Percent of Black Voters	Percent of White Votes			Percent of White Voters
			Correlation Coefficient	Ecological Regression	King's Ecological Inference	Ecological Regression	Correlation Coefficient	Ecological Regression	King's Ecological Inference	Ecological Regression
Election for partial term seat (vote for 1)										
Klinefelt	W	65.0	-.808	47.4	39.6	47.4	.808	85.3	80.5	85.3
Gladney	B	35.0	.808	52.6	60.0	52.6	-.808	14.7	19.7	14.7
Turnout of CVAP		*14.7*		*21.6*	*16.5*			*10.7*	*13.8*	
Election for two full term seats (vote for 2)										
DeMonaco, Jr.	W	30.0	-.784	19.6	14.5	35.9	.784	43.3	39.2	72.0
Duren	B	9.9	-.709	5.7	11.2	10.4	.709	15.3	12.3	25.4
Williams	B	19.1	-.104	18.0	17.2	33.0	.104	20.4	18.5	34.0
Owens	B	23.1	.701	29.8	36.8	54.6	-.701	14.5	14.7	24.1
Johnson	B	17.9	.785	26.8	30.6	49.1	-.785	6.5	10.1	10.8
Turnout of CVAP		*14.7*	*.451*	*21.6*	*16.5*		*-.451*	*10.7*	*13.8*	

Table 2: 2017 City Council Contests Analyzed using BISG Data

2017 City Council Elections	Race of Candidate	Actual Percent of Votes Received by Candidate	Percent of Black Voters		Percent of White Voters	
			Ecological Regression	King's Ecological Inference	Ecological Regression	King's Ecological Inference
Election for partial term seat (vote for 1)						
Klinefelt	W	65.0	14.9	24.0	76.2	73.6
Gladney	B	35.0	79.3	75.0	20.2	20.9
Votes cast of turnout		*95.9*	*94.1*	*90.8*	*96.4*	*96.7*
Election for two full term seats (vote for 2)						
DeMonaco, Jr.	W	30.0	6.1	9.0	66.2	66.5
Duren	B	9.9	-.7	1.3	21.8	21.0
Williams	B	19.1	33.7	28.3	34.0	34.5
Owens	B	23.1	75.8	83.8	30.3	27.7
Johnson	B	17.9	79.9	71.3	17.2	19.2
Votes cast of turnout		*87.7*	*97.4*	*86.2*	*84.7*	*86.9*

Appendix

Election date and office	Estimated voter preferences		Racially polarized?	Winners (Eastpointe only)	Dr. Alford's conclusions (based solely on ACS data)	Dr. Zax's conclusions
	Black voters	White voters				
November 2017 City Council: partial-term seat	Gladney (B)	Klinefelt	Racially polarized	Klinefelt	(Not analyzed)	(Did not discuss)
November 2017 City Council: full-term seat (2 to be elected)	Owens (B) Johnson (B)	DeMonaco Williams (B)	Racially polarized	DeMonaco Owens (B)	(Not analyzed)	(Did not discuss)

Election date and office	Estimated voter preferences		Racially polarized?	Winners (Eastpointe only)	Dr. Alford's conclusions (based solely on ACS data)	Dr. Zax's conclusions
	Black voters	White voters				
November 2015 City Council (2 to be elected)	Handley BISG: Williams (B) Lucido Handley ACS: Lucido Williams (B) Alford EI: Lucido Marion Alford ER: Lucido Williams (B)	Lucido Marion	Racially polarized	Lucido Marion	Not racially polarized. Even if blacks did support black candidate as second choice (as ER estimates indicate), blacks were not 70 percent cohesive.	Racially polarized using BISG but not ACS data. No racial polarization if the first-choice candidate of blacks won, even in a two-seat race.
February 2015 Special election for city council	Handley: Owens (B) Alford EI: DeMonaco Alford ER: Owens (B)	DeMonaco	Racially polarized	DeMonaco	Not racially polarized. Even if 52.8 percent of black voters supported a black candidate in three candidate contest blacks were not 70 percent cohesive.	Racially polarized using BISG, undetermined using ACS data alone because ER estimates should be ignored.

Election date and office	Estimated voter preferences		Racially polarized?	Winners (Eastpointe only)	Dr. Alford's conclusions (based solely on ACS data)	Dr. Zax's conclusions
	Black voters	White voters				
November 2011 city council (2 to be elected)	Guastella LaForest	LaForest Guastella	Not polarized	LaForest Guastella	Not racially polarized	(Did not discuss)
November 2009 city council (2 to be elected)	Richardson Sweeney	Sweeney Richardson	Not polarized	Sweeney Richardson	Not racially polarized	(Did not discuss)
November 2014 school board (3 to be elected)	Jackson (Mixed race) Devita Borsa	Devita Borsa Jackson (Mixed race)	Only three candidates ran for three seats. Jackson first choice of blacks and last choice of whites, with some white voters declining to cast their third vote rather than support Jackson.	Devita Borsa Jackson (Mixed race)	Not racially polarized because all three candidates won by default.	Not racially polarized because all three candidates won by default.

Election date and office	Estimated voter preferences		Racially polarized?	Winners (Eastpointe only)	Dr. Alford's conclusions (based solely on ACS data)	Dr. Zax's conclusions
	Black voters	White voters				
November 2009 school board (3 to be elected)	Washington (B) Wodecki Seibert	Wodecki Seibert Gruenberg	Racially polarized	Wodecki Seibert Gruenberg	Racially polarized but should be disregarded because other school board contests and contemporaneous city council election were not polarized.	(Did not discuss)
November 2016 Circuit Court judge	Dennings (B) Rancilio	Handley ACS ER, BISG EI: Servitto Dennings (B)	May or may not be polarized as estimates diverge by methodology	Servitto Dennings (B)	Not racially polarized because whites did not vote as a bloc to defeat black-preferred candidate.	Not racially polarized because the black-preferred candidate won.
August 2016 primary circuit court judge (Vote for 2, top 4 candidates advance)	Handley BISG: Dennings (B) Rancilio Handley ACS: Servitto Rancilio	Servitto Rancilio	BISG estimates indicate racially polarized.	Servitto Rancilio Dennings (B) Velardo	Not polarized because the African American proceeded to general election.	Not polarized because black-preferred African American proceeded to the general election.

Election date and office	Estimated voter preferences		Racially polarized?	Winners (Eastpointe only)	Dr. Alford's conclusions (based solely on ACS data)	Dr. Zax's conclusions
	Black voters	White voters				
November 2014 Michigan Supreme Court (partial term)	Thomas (B)	Viviano	Racially polarized	Viviano	Not polarized because black voters were not 70 percent cohesive.	Racially polarized
November 2012 Michigan Supreme Court (partial term)	Johnson (B)	Zahra	Racially polarized	Johnson (B)	Not polarized because the black-preferred candidate carried Eastpointe.	(Did not discuss)

Election date and office	Estimated voter preferences		Racially polarized?	Winners (Eastpointe only)	Dr. Alford's conclusions (based solely on ACS data)	Dr. Zax's conclusions
	Black voters	White voters				
November 2010 Michigan Supreme Court	Morris (B) Davis	Kelly Young (B)	Racially polarized	Kelly Young (B)	Polarized but it is a "partisan result" and should also be disregarded because other Supreme Court contests were not polarized.	(Did not discuss)
November 2012 Macomb Community College Board (partial term)	Jackson (Mixed race)	Cusumano	Racially polarized	Cusumano	Not polarized because black voters were not 70 percent cohesive.	(Did not discuss)